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U.S. Department of Transportation
Federal Aviation Administration

General Aviation Airworthiness Alerts

AC No. 43-16

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Alert No. 92
March 1986

Improve Reliability-Interchange Service Experience

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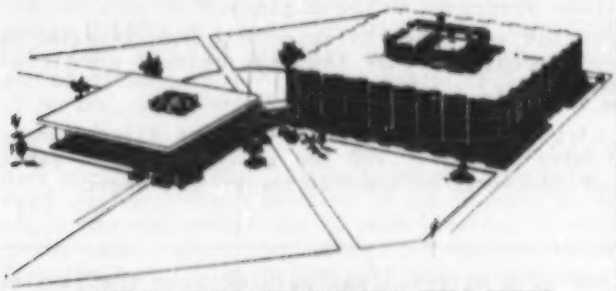
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C. 20590

ADVISORY CIRCULAR
AC 43-16

GENERAL AVIATION AIRWORTHINESS ALERTS

MARCH 1986



AVIATION STANDARDS NATIONAL FIELD OFFICE
MIKE MONRONEY AERONAUTICAL CENTER

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported to be significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: Aviation Standards National Field Office, Attn: AVN-110, P.O. Box 26460, Oklahoma City, Oklahoma 73125.

AIRCRAFT

BEECH

Beech Model A36TC	Inlet Assembly P/N 642668	The turbocharger adapter inlet pipe split and separated. The split was where the left exhaust pipe joins with the right side entering the turbocharger. Part time - 99 hours.
Beech Model 58	Water in Pitot/Static System	The takeoff was aborted because of low indicated airspeed. Investigation revealed water in the pitot/static system. The aircraft had been subjected to heavy rainfall just prior to the flight. The submitter suggests the pitot/static system be drained on aircraft that are in heavy rainstorms prior to flight.

NOTICE TO READERS: The General Aviation Airworthiness Alerts are, for the most part, prepared from information supplied by those who operate and maintain aircraft. The FAA encourages the reporting of all malfunctions or defects that come to the attention of service or operating personnel, even though the problem has been previously reported. FAA Form 8010-4, Malfunction or Defect Report, which supersedes FAA Form 8330-2, Malfunction or Defect Report is available from the local General Aviation District Office and may be used for reporting purposes.

Beech
Model 60

Exhaust Pipe

The Service Difficulty Report (SDR) data bank contains 17 reports on Beech Model 60, A60, and B60 exhaust system components processed since January 1980. An upward trend was identified as 5 of the 17 reports were received in the 7-month period from March through September 1985.

The right hand rear intermediate exhaust pipe, part number 77429, accounted for 10 of the 17 reports. The exhaust pipe condition was reported as loose, coming off, or disconnected in seven of the reports. Continued expansion and contraction of the exhaust system is reported to cause distortion of the 90 degree bend in the exhaust pipe. This, along with wear to the slip joints on each end of the pipe, apparently allows the ends to disengage from the other exhaust system components. Examination of the SDR printout and applicable parts listings revealed that the same exhaust system components are used on all Beech 60, A60, and B60 airplanes.

The reported total time at failure averaged 694 hours and ranged from 290 to 800 hours.

A review of the Beech 60 series service information and Airworthiness Directives revealed no modification or inspection of the exhaust system components other than the general condition inspection required by the 100-hour inspection checklist.

Two articles have been published in Advisory Circular 43-16, General Aviation Airworthiness Alerts, concerning this problem. Issue number 19 dated February 1980 and issue number 84 dated July 1985 both discussed failures of exhaust system components on Beech 60 series airplanes.

Beech
Model 60

Passenger Step

Non-skid material was painted over the leading edge of the folding step giving the impression the entire step was usable. The submitter advises that if a person steps on the leading edge, the step will fold. He recommends the non-skid material be limited to 2 inches aft of the leading edge to the trailing edge of the step. This may alert people not to step on the leading edge.

C E S S N A

Cessna
All Single Engine
Models

Ground Handling

Service experience and engineering tests show damage can be caused by excessive loads being imposed on the horizontal stabilizer when improper procedures are used during ground handling. It is important that pushing forces be applied close to the fuselage when moving an aircraft by the horizontal stabilizer. Check the procedures given in your Cessna Service Manuals.

The best procedure for ground handling would be to use a tow bar.

NOTE: This article has been published in previous Alerts. Reports indicate improper procedures are still being used.

Horizontal Stabilizer
Attach Stiffeners

Cessna Model 152	Low Voltage Warning System	There was an electrical burning odor and the pilot noticed the alternator circuit breaker was tripped. Investigation disclosed a defective alternator control unit. During run and test after parts replacement, it was observed that when the alternator circuit breaker is tripped the low voltage warning system is inoperative. The submitter recommends a warning placard be placed in aircraft with this system design.

Cessna
Models 150, 172
177, 180, 185,
and 188

Fuel Strainer

The service difficulty program data bank contains 38 reports on the Cessna fuel strainer, part number 0756005-8. This fuel strainer is installed on Cessna models included in the 150, 172, 177, 180, 185, and 188 airplane groups. These reports were entered into the data bank during the period of January 1980 through August 1985. The upward trend in reporting, 24 reports in the past 22 months, was alerted by the service difficulty program automatic alerting function.

The fuel strainer plunger is responsible for 21 (55 percent) of the 38 reports. This plunger, part number 0756010-6, is designed to allow water and other contaminants to be drained from the fuel system. The condition of the plunger is reported as deteriorated or separated at the rubber tip. When the rubber tip is deteriorated, it allows fuel to leak past the seal and out of the drain tube. When the rubber tip has separated from the plunger, contaminants cannot be drained from the fuel system on the preflight inspection.

NOTE: Articles have appeared in the Alerts (reference the strainer and plunger problems).

Cessna
Model 177RG

Actuator Bearing
P/N S2049-6FG

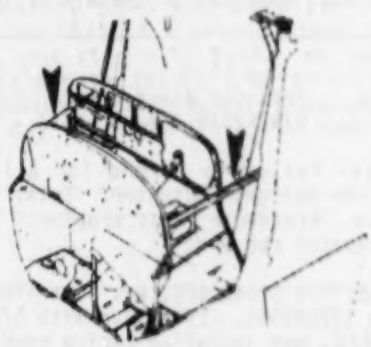
The landing gear failed to extend for a landing. An investigation disclosed failure of the rod end bearing on the maingear actuator. Total aircraft time - 260 hours. Articles have been in previous Alerts referencing this problem. The following changes relate to the service history of the maingear actuator rod end:

> Rod end, P/N S2049-6FG, was installed on production airplanes from S/N 177RG0001 through 177RG0962. Effective with S/N 177RG0973, a higher strength rod end, P/N S2049M6FG, was installed during production. This part (S2049M6FG) was also used for all spares; however, it was not totally effective in eliminating the failure problem.
>
> Cessna issued Single-Engine Service Letter No. SE79-37 on August 6, 1979, which announced the availability of a new rod end for all in-service airplanes up to and including S/N 177RG1366. The new rod end is made by Astro and is identified by Cessna P/N S2426-6. The Astro P/N ARB6EDU may also be on the part. This part is easily identified as it does not have a threaded hole for a grease fitting.

Cessna recommends that main landing gear actuator rod end, P/N S2049-6FG, be replaced with the new part prior to or at the next inspection.

NOTE: The above article was published in Alerts No. 20 dated March 1980, No. 56 dated March 1983, and No. 67 dated February 1984. However, broken rod ends, P/N S2049-6FG, are still being reported. A recent Malfunction or Defect Report advised considerable aircraft damage resulted from a broken bearing and gear-up landing. This submitter suggests an airworthiness directive be issued to replace and remove all the old part number rod ends from service.

Cessna Model 177RG	Jammed Aileron Bellcrank	The right aileron bellcrank was found jammed behind the up bellcrank stop bolt. The aileron stop bracket (P/N 1221088-8) was found installed 1/4-inch off station. This allowed the stop bolt to lock underneath the bellcrank when the controls were moved hard against the up aileron stop. The submitter suggests checking other aircraft of this model for this condition.
Cessna Model 182	Deteriorated Drain	Automotive fuel had been used in the aircraft for the previous 5 months. The owner advised of a fuel leak from the left fuel cell when the aircraft was delivered for an annual inspection. Inspection revealed that the quick drain nipple had deteriorated near the bottom of the cell. The submitter advised that auto fuel is not compatible with material in the nipple portion of the fuel cell and should not be used in BTC-39 cells.
Cessna Model 182	Melted Static Tube	When the cabin heat is on, the nylon static tube will melt causing altimeter errors. The submitter recommends replacing the nylon polyethylene tubes with aluminum tubes where the tubes cross the cabin heat channels.
Cessna Models P172, 175 and 175 with 180 hp engine conversion (STC SA424CE)	Engine mount upper stringers, P/N's 0513132-3 and 0513132-4 and engine mount upper bracket P/N 0513132-11	There have been several reports of cracks and loose rivets in the engine mount upper support stringers and mount attach brackets (located behind the firewall). Security of the brackets and stringers should be carefully checked at annual inspection along with a visual observance for any cracks or breakage at the firewall attachment points.
Cessna Model TU206G	Turbocharger Hose	The wire braid turbocharger oil pressure hose wore a hole in the P/N 1213433-6 engine mount support channel. The submitter has found this condition on other Cessna T206 and T210 aircraft. He suggests tying the hose up off of the support channel plus installation of a Micarta scuff strip. Aircraft time - 775 hours.
Cessna Model 207A	Draglink Bolt P/N NAS464P5A42	The nosegear collapsed during taxi. Investigation disclosed the aft draglink bolt on the nosegear had broken. The submitter advised bolts average approximately 300 hours. Time on this failed bolt - 230 hours.



Cessna Model T337G	Emergency Alternator System

During an annual inspection, the four dry cell alkaline batteries were found corroded, rusty, and leaking. The submitter reports the batteries had probably not been checked since installed in 1973. The following article was published in Alerts No. 50 dated September 1982.

The electrical system ceased functioning during flight. The emergency restart procedures failed to restore alternator operation. An inspection revealed the emergency alternator batteries were not installed. An annual inspection had been recently completed on the aircraft. The submitter interviewed several mechanics who indicated they were not aware of the system. Apparently, the Cessna checklist does not mention these components.

Cessna Service Manual P/N D2516-7-13 contains the following information pertaining to the pressurized 337 aircraft.

DESCRIPTION. The alternator system is equipped with a restart pushbutton switch on the instrument panel located adjacent to the warning lights. Also, four alkaline dry cell batteries, located on the control quadrant support forward of the panel, supply power for the system. Depress the alternator restart switch and voltage from the batteries is supplied directly to both alternator fields. Alternators will "pick up" a full load using this excitation system without the benefit of the aircraft storage battery.

EMERGENCY ALTERNATOR RESTART SYSTEM FUNCTIONAL TEST. Operation of the emergency alternator restart system should be tested occasionally. Start both front and rear engines, and run at approximately 1,500 r.p.m. for several minutes. Turn on all electrical equipment to produce a maximum electrical running load condition. The amber "DIS" light should remain off. Momentarily, turn off all sections of the master switch, then turn on both "ALT" switches. Depress the alternator restart switch for one second. Both alternators will pick up the load. Note that fuel and cylinder head temperature gauges are operating. The system should now be operating without benefit of the aircraft storage battery. If the system fails to pick up the electrical load, as evidenced by no fuel or cylinder head temperature gauge indication, turn off one of the higher electrical loads, such as landing lights or pitot heat, and depress the alternator restart switch. As the 1 1/2-volt (1/2 D size) batteries deteriorate, approximately 2 years, they are less capable of restarting the alternator. Any time alternators cannot be restarted under full load, the batteries should be replaced.

CAUTION

Upon completion of the preceding test, turn on the battery portion of the master switch so the battery can stabilize the system. Operating the electrical system without benefit of battery stabilization is not recommended.

Cessna Service Manuals, P/N's D2506-6-13 and D2500-13, contain information pertaining to the emergency alternator system on other Cessna 337 aircraft.

Cessna Model 414A	Gear Uplock Hook P/N 574202-6	Cracks are found in this part at approximately 2,000 hours of normal aircraft use. The submitter has replaced several cracked hooks with the heavier P/N 5741222-16 & 17 hooks which have not cracked. He suggests replacement with the heavier hooks. NOTE: Related article was published in Alerts No. 90 dated January 1986.

Cessna Model 421B	Tube Assembly P/N 5093404-2	The operator reported the right elevator flutters at cruise airspeeds. Investigation revealed play in the right elevator torque tube at the taper pin attachment. There was also play in the left outboard hinge. The submitter recommends a thorough inspection of these areas during scheduled inspections.

DEHAVILLAND

DeHavilland Model DHC-6-100 -200 and -300	Wing Struts P/N C6W1005-7-8	It has been reported that two wing struts on the same aircraft have experienced exfoliation corrosion in the strut beam flanges enclosed by the strut skins. Both the inside and the outside of the struts for the first 20 inches from either end are of special concern. It is recommended that the entire length of strut and the internal fuel line adjacent to the wing strut beam be inspected for corrosion. If a borescope is used for the internal inspection, the complete length of the wing strut beam should be examined. Evidence of significant corrosion anywhere on the strut is good cause for replacement of the strut before further flight. NOTE: Service Bulletin SB 6/474 dated 6/14/85 issued on subject stated above.

GATES LEARJET

Gates Learjet Model 35	Valve Actuator Motor	The windshield heat valve stuck open. Investigation revealed carbon dust and dirt in the motor commutator area. The submitter suspects the motor life is approximately 4,000 to 4,500 hours based on a previous failure. The submitter suggests component removal and replacement at 4,000 hour intervals. Aircraft time - 4,374 hours.

ISRAEL AIRCRAFT

Israel Aircraft Model 1124	Windshield Heat Cycling Contactor

The aircraft experienced a failure of the right windshield heat. The circuit breaker had popped. When the breaker was reset, it remained in, but did not regain windshield heat. It was found that the right windshield heat cycling contactor (WCC) caused the failure. The contacts of the contactor failed causing severe arcing and eventual meltdown of the contactor. The remote control breaker (RCB) that controls the electrical power to the WCC eventually did pop the circuit breaker in the cockpit, but not before the heat coming from the WCC destroyed the RCB and melted the insulation off of several wires in the surrounding area. This operator heard of another instance like this happening on another Westwind. In the second case, though, they lost some other aircraft and engine systems in conjunction with the WCC burning up. The aircraft manufacturer has issued a Service Bulletin (SB1124-30-036) on this system which requires a voltage check across the contactor to determine the condition of the contacts. It is this operator's opinion that the covers on the WCC contactors should be removed at each inspection, and the contacts visually inspected and any carbon dust build up removed.

MAULE

Maule Model M-5-235C	Fuel Filler Tank Necks	The fuel filler tank necks were severely rusted. Rust flakes were found in the fuel tanks, fuel pumps, strainer, and in the carburetor. The corroded rusty area was located at the steel neck where it is pressed into the aluminum tank. Aircraft time - 905 hours.

MOONEY

Mooney Model M20F	Corroded Splice Plate	The cockpit carpet was pulled to inspect the main spar during an annual inspection. The splice plate had severe intergranular corrosion where the carpet contacts the plate. The submitter suggests that owners and pilots raise the carpet while in the pilot's seat and check this area during preflight. He also suggested the carpet be trimmed or the spar splice plate area be coated with a clear resin for protection yet still allow inspection. Aircraft time - 2,858 hours.

PIPER

Piper Model PA-28-181	Battery Box Drains	A plastic cap was found over the battery box drain. The cap prevented proper drainage. The aircraft had severe corrosion at the battery box and on the bulkhead. A check of seven other PA-28 series aircraft with the rear mounted battery boxes revealed five of the seven had the battery drains plugged.

NOTE: This article was published in Alerts No. 89 dated December 1985. Piper Aircraft Maintenance Manual contains the following regarding the subject:

BATTERY BOX CORROSION PREVENTION.

The battery should be checked for spilled electrolyte or corrosion at least each 50 hour inspection or at least every 30 days, whichever comes first. Should this be found in the box, on the terminals or around the battery, the battery should be removed and both the box and battery cleaned by the following procedure:

1. Remove the box drain cap from the under side of the fuselage and drain off any electrolyte that may have overflowed into the box.

--CAUTION--

Do not allow soda solution to enter battery.

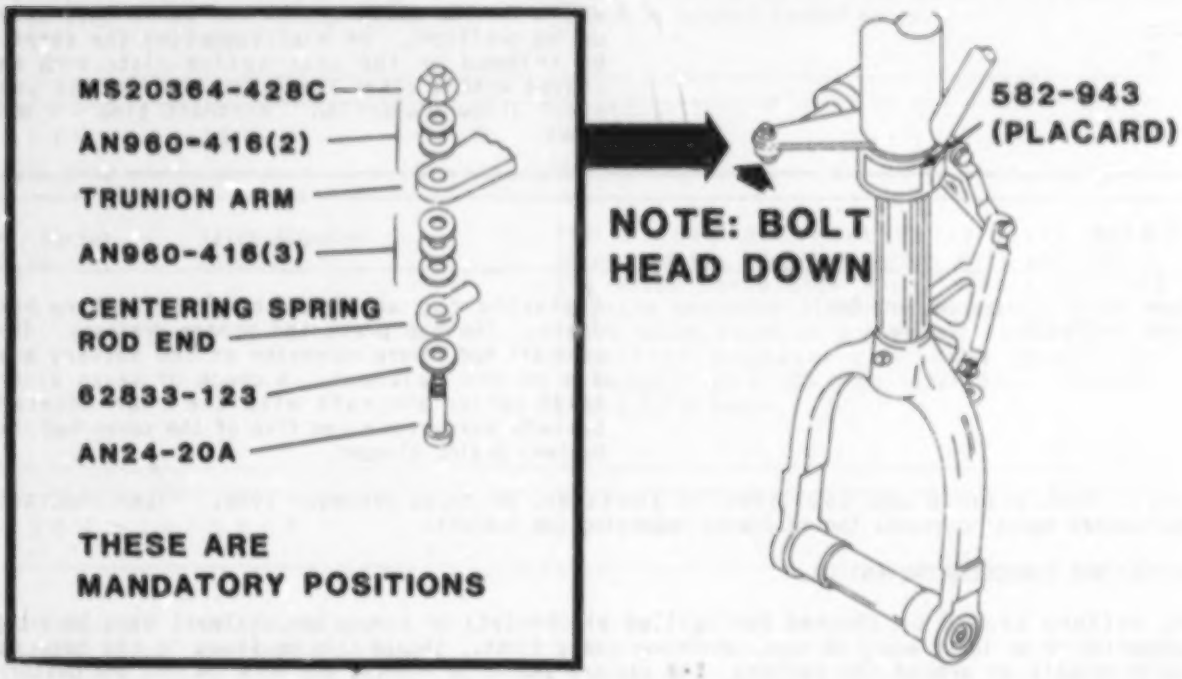
2. Clean the battery and the box. Corrosion effects may be neutralized by applying a solution of baking soda and water mixed to a consistency of thin cream. The application of this mixture should be applied until all bubbling action has ceased.
3. Rinse the battery and box with clean water and dry.
4. Place the cap over the battery box drain.
5. Reinstall the battery.

Piper Nosegear
Model PA-34-200T

The nosegear centering attach bolt can be installed incorrectly. When installed incorrectly, the nosegear can be restricted in the retracted position by the nosegear door mechanism. When the bolt is installed head down, it is correct as shown in Seneca Service Manual, Figure 7-1. Piper Service Letter No. 852 dated September 14, 1978, announced the availability of a placard to be installed on the nosegear. The placard is a reminder or caution as to the correct installation of the bolt.

MODELS AFFECTED	SERIAL NUMBERS
PA-34-200, Seneca I	34-7250001 to 34-7450220 inclusive
PA-34-200T, Seneca II	34-7570001 to 34-7870113 inclusive

The preceding article was published in Alerts No. 24 dated July 1980. There was a recent report of PA-34-200T landing nosegear up because the bolt was incorrectly installed. Another PA-34-200T was found with the bolt installed incorrectly, and a spacer was installed instead of washers. The sketch is from Piper Seneca II Service Manual, Figure 7-1, revised August 10, 1980.



NOTE: The above article was published in Alerts No. 79 dated February 1985. A report was received in September 1985 of the nosegear failure to extend during landing because the bolt was installed incorrectly. The placard required by Service Letter No. 852 was partially missing and unreadable which may have contributed to incorrect installation of the bolt.

Piper Model PA-44-180	Chafing Throttle Cable	The right engine throttle cable was difficult to operate and made a scraping sound. Investigation revealed the cable was frayed at the cable mount near the carburetor throttle connection. The previous cable had been replaced for the same problem. The submitter recommends changing the angle of the cable to the throttle body to prevent the cable from chafing internally.

Piper Model PA-46-310P	Air-Conditioner Drive Pulley	The air-conditioner compressor drive pulley was found excessively worn and loose. The pulley is located on the rear of the starter adapter installed on a shaft that is neither tapered nor keyed. The compression of the attaching nut is all that prevents the pulley from turning on the shaft. The nut torque appeared to be correct. The pulley is near the mixture control arm, and engine failure would have occurred had the pulley separated from the engine. The submitter recommends a keyed or splined shaft for the air-conditioner compressor drive pulley.

WYTWORNIA SPRZETU

Wytwornia Sprzetu Model PZL M18	Ignition Coil P/N KP-4716 and Starting Switch (P/N WM-177) Relocation	PZL-MIELEC published Mandatory Engineering Bulletin (MEB) K/02.079/85 dated July 1985 (Supplement to Bulletin K/02.060/83 dated October 1983) which relocates ignition coil (P/N KP-4716) and Starting Switch (P/N WM-177). These changes were incorporated as a result of powerplant vibration test results on the modified engine frame described in Bulletin K/02.060/83. The estimated labor requirement for accomplishment of the MEB is 8 hours with parts supplied by PZL-MIELEC at factory cost. Effectivity through airplane S/N 1Z014-18.

ACCESSORIES

ROTO-MASTER

Roto-Master Turbocharger	Housing Cracks P/N 000510-04

The service difficulty program data bank contains 28 reports on models 325E10 and 3AT6EE10J2 Roto-Master (formerly Rajay Industries) turbocharger turbine system housings, Part Number (P/N) 600510-04. The reported systems were installed on Teledyne Continental Models L/TSIO-360-E, EB, FB, GB, and KB engines. These reports were processed during a 29-month period from April 15, 1983, through September 27, 1985. There is a definite upward trend in the rate of reporting as 14 of the 28 reports were processed in the first 9 months of 1985.

Analysis of the Service Difficulty Report data determined that cracks in the turbine housings were responsible for the high report rate. The reported information located the majority of these cracks in the exhaust inlet area of the turbine housing, but did not contain sufficient detail to determine a cause for the cracks. Reported total time at failure averaged 530 hours and ranged from 50 to 1,984 hours.

Review of the Continental and Roto-Master service information and Airworthiness Directives (AD), revealed a service letter, a service bulletin, and an AD that were pertinent. Those pertinent are AD 82-27-03, effective December 30, 1982, a related Roto-Master Service Letter Number 27, Revision A, dated September 24, 1982, and addendum thereto, dated February 9, 1983, and a related Teledyne Continental Service Bulletin M83-3. The AD and bulletin required periodic inspection of Roto-Master Models 325E16 and 3AT6E102J2 turbine exhaust systems or the replacement of the original turbine housings with an improved Roto-Master housing, P/N 600510-04 (Teledyne Continental Motors, P/N 643931). This corrective action apparently did not resolve the problem as there have been 28 reports since the effective date of AD 82-27-03, and they all cited the replacement turbine housing (P/N 600510-04).

SLICK

Slick Magneto Model 6224	Magneto Problems	The right engine on a Cessna T303 had excessive magneto drop during engine run. Investigation disclosed the interior of the magnetos were covered with a gummy residue. The residue was possibly caused by pressurization from the turbocharger. The right magneto block and gear assembly were also found melted and arcing to ground. The submitter advised that improved filtering from the pressure line may be beneficial. Time on the magnetoes - 470 hours.

ENGINES

CONTINENTAL

Continental Models IO-360 TSIO-360 and LTSIO-360 Engines	Connecting Rod and Cap P/N 626119	Connecting rods manufactured to drawing P/N 626119 are supplied to TCM by more than one vendor. It has been reported that a disproportionate number of rod failures have occurred with rods marked along the beam section with the letter C enclosed within a circle. It is recommended these rods be replaced at the first opportunity with rods having different vendor markings. NOTE: Article previously published in Alerts No. 65 dated December 1983.
Continental Model IO-520F	Silicone Sealer	The engine failed from oil starvation to No. 4 connecting rod. Investigation revealed an oil passage was blocked from an excessive amount of sealant that had been applied to the oil cooler plate. The sealant appeared to be what is commonly called RTV. The submitter suggests all mechanics be aware and use care when this type sealant is used where it can be introduced into the oil or fuel system.

OF INTEREST

SERVICE LETTER REMINDER

The Champion Aircraft Company advised that they are now producing the Champion Citabria, Decathlon, and Scout, which were purchases from Bellanca Aircraft. They requested that service personnel in the field be reminded of Bellanca Service Letter dated December 13, 1978:

SUBJECT: Landing Gear Thru-Bolt and U-Bolt Inspection and Maintenance;
Parts and Service Manual Part Number Corrections

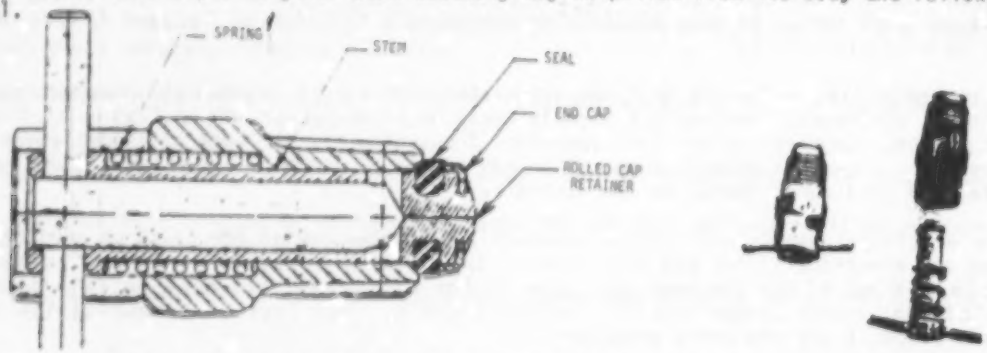
AIRCRAFT AFFECTED: 7ECA, 7GCAA, 7KCAB, 7GCBC, 8KCAB, 8GCBC

NOTE: The above article was published in Alert No. 77 dated December 1984. The present holder of the Type Certificate for the above aircraft is Tetellestai, Inc., 3821 Westlake Drive, Austin, Texas 78746.

LOSS OF FUEL - FUEL DRAIN VALVES

There have been a number of Malfunction or Defect Reports advising of the loss of the stem from Part Numbers CCA-1550 and CCA-1600 Curtis Dyna-Products fuel drain valves. Loss of the center shaft stem assembly usually results in draining the fuel tank. Examination of this valve design has revealed that the stem will be ejected from its valve body by spring tension if its seal deteriorates to a point where it no longer provides a cushion for the stem end cap. Loss of cushion caused the cap's deformation and/or the shearing of the end cap's rolled metal retainer. Once the end cap has departed the stem and the remaining seal seat material is sheared away, the spring will eject the stem from its valve body allowing fuel to drain freely.

The rate of seal deterioration, which normally occurs after hundreds of valve closings, has been greatly accelerated recently by seal exposure to low lead gasoline. The low lead gasoline softens the seal material thereby increasing its wear rate. The seal material, a nitrile compound, has been found to be the best of the presently available materials for this application. In most instances, a marginal seal can be detected by fuel leakage from around the valve stem, but not in all instances. Because of this inconsistency, the submitter recommends that after the valve has been closed, firmly grasp the stem handles and pull downward. If any downward movement of the stem is felt, remove and inspect the valve assembly prior to flight. CAUTION: When pulling downward on the valve stem, a marginal stem assembly may be pulled from its body and followed by a gush of fuel.



NOTE: The above article was published in Alerts No. 84 dated July 1985. A mechanic advised he has found several leaking valves with "O" rings installed instead of the proper seal. The mechanic requested owners and pilots be advised that installing "O" rings is a no-no and requested the part numbers for the proper seals be published.

CCA-1550 - Seal Part Number 1269 CCA-1600 - Seal Part Number 1319

WE AGREE - GOOD ADVICE

I'm writing in reference to a Maintenance Note written on General Aviation Airworthiness Alerts, AC 43-16, Alerts No. 84, July 1985, Page 13, entitled Loss of Fuel - Fuel Drain Valves. While flying as a bush pilot and mechanic in Bolivia, South America, for a number of years I encountered the problem discussed at least four times.

Most of the times the drain valve broke as I was draining fuel on preflight. However on one flight in a light twin, the stem came loose in flight, but did not pop out. I landed and refueled and upon checking the fuel drains I noticed one stem was partially out and as soon as it was touched it popped out, of course, with fuel gushing out.

We found that most people will release the drain and let it snap closed with considerable force. This will eventually hammer the retainer off the stem. Because of this, the company recommended that we all close these type of fuel drains slowly and not let them pop closed. The springs are quite strong and make closing the drains slowly a bit uncomfortable. We have had no more problems since we changed our way of closing the drains. NOTE: Published as received from submitter.

SOMETHING TO THINK ABOUT

AVOIDING BIRD STRIKES

The following article was published in the November 1983 issue of Commuter Air. It is being reprinted with the permission of the author, Mr. Michael J. Harrison.

Bird hazards to aircraft can create serious inflight emergency conditions if the pilot and crew are not prepared to handle the situation. As a pilot who experienced two serious bird strikes which required emergency landings, and as a biologist who has spent the last 9 years working on bird hazards to aircraft, some personal observations may assist other pilots in dealing with a mid-air bird strike.

Any bird, regardless of size, should be considered as a potential hazard, especially when you are flying enroute. The speed of the aircraft dictates the force of impact--the faster you are flying, the greater the impact forces. As speed doubles, the kinetic energy which must be dissipated on impact increases by a factor of four. Consequently, if you must descend into an area of high bird concentrations, consider your approach speeds.

At what altitude are you safe from birds? Strikes have been reported as high as 33,000 feet, and ducks and geese have been observed at and above 20,000 feet MSL. These altitudes are the exception rather than the rule. Over 90 percent of all civil bird strikes in the United States occur below 3,000 feet. At what altitude do you usually flight plan for and fly during the fall and spring bird migrations?

There are essentially two major risks associated with birds: windshield penetrations and engine ingestions. Windshield penetrations usually occur on climbout or while flying at higher speeds during cruise. Commuter or air taxi operators frequently fly at lower altitudes where birds share the airspace. A typical cockpit penetration can result in facial lacerations, cuts on the hands and face, and structural damage to the aircraft.

Because electrical panels and circuit breakers are located behind the pilot or copilot, electrical failures and electrical fires may also occur. In air taxi operations, injury to passengers is possible. Wind blast through the hole in the windshield can make cockpit communications impossible and radio communications unintelligible. The loss of communication ability can seriously compound any emergency procedure.

The spinning propeller in front of the windshield is no protection. In high speed situations, pilots should consider initiating a climb to reduce speed and wind blast, and consider flying above flocks of birds. With the windshield missing, changes in airflow may affect the pilot's ability to control the aircraft at slower speeds. Don't stall the aircraft in the traffic pattern because you failed to perform a controllability check.

In an engine ingestion situation, damage can vary. On turbine or turboprop engines, the most common outcome is no damage or slight damage to the engine fan or compressor blades. However, in more serious situations, blade damage can be sufficient enough to cause increasing engine vibrations, high exhaust temperatures, compressor stalls, engine fires or catastrophic failures. There was one such event where a rear fuselage-mounted engine on an executive jet was ripped from its mounting following a collision with a pelican.

Birds involved in engine ingestions are frequently flocking birds, increasing the possibility of damage to more than one engine. Another interesting occurrence is that some engines may have the airflow choked off by bird remains and quit running, but no damage occurs.

The most critical engine ingestion scenario is a single or multiple engine ingestion causing a power loss on takeoff. During this critical phase of flight, it is essential that the pilot properly recognize the emergency situation and perform proper engine-out or crash landing emergency procedures.

Pilots are encouraged to consider the following bird hazard checklist:

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1. Review information in the NOTAMS and the Airport/Facility Directory about your departure and destination airport.

2. Flight plan at an altitude above 3,000 feet; the higher the better.

3. Avoid overflight of national wild-life refuges.

4. Flight plan to avoid flying along rivers or shorelines in the fall and spring. Birds frequently follow these natural terrain features during migration.

5. Thoroughly brief emergency procedures before departure, including those procedures to be followed if cockpit communications are lost.

6. During taxiing, watch for birds on the airport If birds are observed, request that airport management disperse the birds before takeoff.

7. Do not take off if flocks of birds are on or adjacent to the runway.

8. If an engine ingestion occurs on takeoff, abort if speed and remaining runway will allow. Inspect the engine before attempting a second takeoff. Several air carrier incidents have occurred where engine failures or high vibrations developed during the flight because of undetected engine damage.

9. If the takoff must be continued, properly identify the affected engine and execute emergency procedures.

10. If structural damage occurs or a windshield is penetrated, consider the need for a controllability check before attempting a landing.

11. If a windshield failure occurs, climb to slow the aircraft and reduce wind blast as necessary.

12. Use sunglasses or smoke goggles to reduce the effect of wind blast, precipitation, or debris.

13. If the windshield is cracked or delaminates, slow the aircraft and wear glasses or goggles to protect the eyes in case of a subsequent failure.

14. During cruise, watch for flocks of migratory birds and attempt to climb above observed flocks.

15. Use landing lights during descent. While there is no concrete evidence that birds see and avoid aircraft, the lights do aid the pilot.

16. If flocks of birds are encountered on descent or on an instrument approach, execute a missed approach, climb, and circle for a second approach. Since most flocks are distributed downward in the airspace, climbing will avoid the greatest number of birds. Birds will also migrate in waves across a wide front; therefore, a delay in the approach may result in clear airspace.

17. If high bird concentrations are encountered, slow the aircraft to minimize impact forces.

18. Upon landing, check the aircraft for bird strike damage.

19. Report all bird strikes on FAA Form 5200-7 (Bird Strike/Incident Report) which is available through the local General Aviation District Office, Flight Service Station, or Airport District Office.

20. Recognize that a bird is a ballistic object much like a bullet. Many pilots never experience a bird strike, and only one-third of all strikes cause damage; however, awareness of the problem can aid in the proper handling of an emergency situation.

These 20 tips are designed to prepare the pilot and crew for a bird strike. Improved pilot awareness of the potential hazard will result in a reduction in the number of serious bird strike incidents.

NOTE: Article was previously published in Alerts No. 68 dated March 1984.

☆ U.S. Government Printing Office: 1986—491-818/20884

U.S. Department
of Transportation

**Federal Aviation
Administration**

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AVN-110

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